

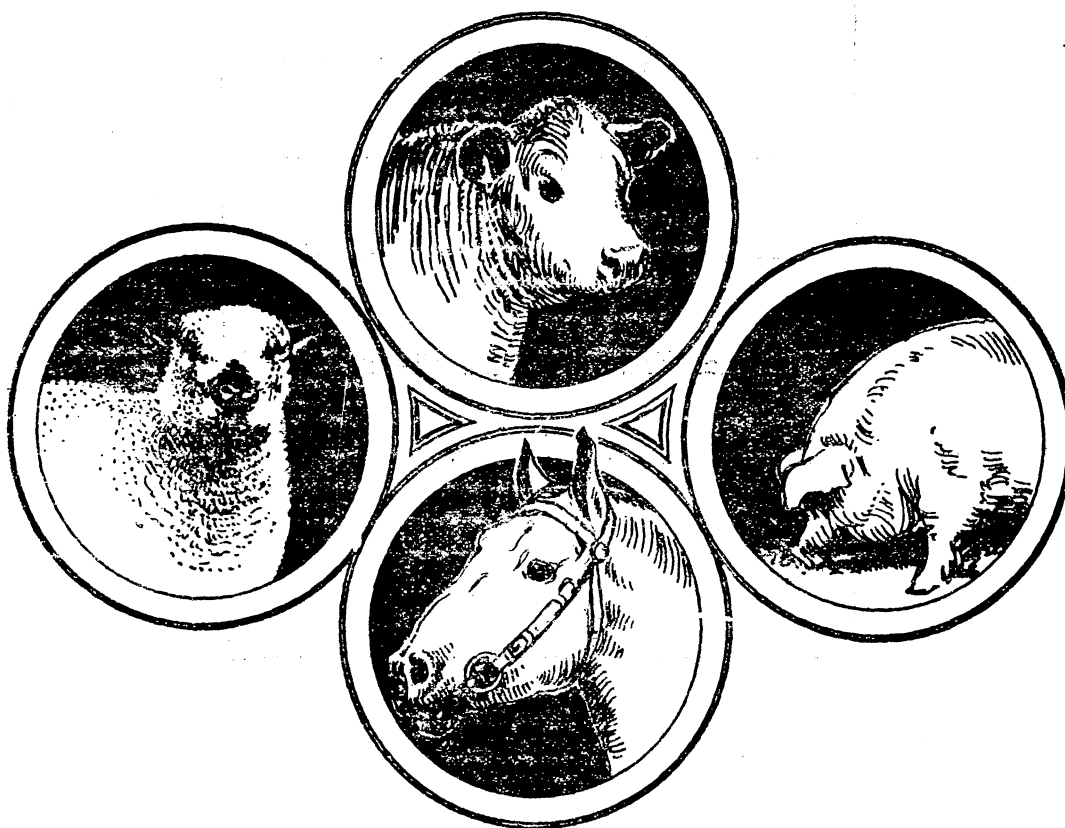
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The EXTENSION ANIMAL HUSBANDMAN



UNITED STATES DEPARTMENT
OF AGRICULTURE
WASHINGTON,
D.C.

Serial No. 19

September, 1930.

For downright fun and satisfaction

I challenge anyone to name a more

interesting, more worth-while field

of human endeavor than the fashion-

ing of fine farm animals.

-- V. A. Rice

UNITED STATES DEPARTMENT OF AGRICULTURE
Washington, D. C.

THE EXTENSION ANIMAL HUSBANDMAN

Issued quarterly by the Bureau of Animal Industry and
the Office of Cooperative Extension Work, Cooperating.
C. D. Lowe, Senior Extension Animal Husbandman.

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-- September, 1930

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TRENCH SILOS AT THE COASTAL PLAIN EXPERIMENT STATION

by
S. W. Greene, Superintendent

- - -

The trench silo is an adaptation of the pit silo which has long been in use. It is much cheaper to construct than a pit silo, requires no materials and no skilled labor. It is simply a trench dug in the ground with a plow and slip scraper to a depth of eight or ten feet with one end sloping up on an incline. The walls are finished smooth and nearly perpendicular with a spade and the silo is completed ready to fill. The width and length are varied according to the number of cattle to be fed.

So far as we know, the first trench silo east of the Mississippi River was constructed at McNeill, Miss., in 1926. Winds of gale force had at various times blown down three stave silos at the station and no funds were available for the construction of a concrete silo. An eight-foot pit dug several years before led the writer to believe there would be no trouble from caving walls in the soil type available and no serious seepage. However, opinion was adverse to the success of a trench silo in a region where the average rainfall is more than 60 inches.

The first silo dug was ten feet deep, ten feet wide, and seventy-five feet long. The soil was Orangeburg sandy loam. No materials were used and no roof was erected. Pasture clippings were thrown in the bottom of the silo to keep the silage out of the clay and the silo filled with sorghum silage cut to a length of about one-half inch with an ordinary blower cutter with only one joint of the vertical pipe attached. The silage was kept tramped down the side walls and was well wet especially along the walls. When the silo was filled level with the ground it was covered with about six inches of pasture clippings to keep out the dirt and then the team and slip scraper were used to cover the straw with about four inches of dirt. The dirt was wet down and a crawler tractor run over the top several times at intervals of a few days.

The silo was filled October 1 and opened for feeding December 20. Feeding started at one end and a vertical slice was taken from top to bottom opening up only enough for two or three days feeding at one time. About two feet of water had accumulated in the bottom of the silo and this was pumped off. As water accumulated from rainfall during the winter it was either pumped out of

dipped out. Practically no silage was lost from spoilage and the silage was bright and had a good aroma. The weight was 35 pounds per cubic foot, which is somewhat lighter than silage from an upright silo. The silage was bright immediately underneath the dirt and straw covering and kept just as well on the top of the slope where the depth was less than a foot as it did in the full depth of the silo.

Another silo was dug in 1927 in a location where seepage developed. At the time of opening there was about five feet of water in the bottom of the silo. Pumping the water out was quite expensive and it had to be kept pumped out every other day in order to feed to the bottom of the silo. One or two feet of silage in the bottom of the silo became water-logged and rank smelling but it was never refused by cattle. This silo was again used successfully in 1928 but with the same trouble with water.

In 1929 a third silo was dug in what was considered an ideal location. The mouth of the silo opened into a deep ravine so that drainage by gravity could be secured. This silo was dug with a tractor pulling three slip scrapers and most of the earth was moved on the level or downhill into the ravine. Three men and the tractor dug this silo to a capacity of 130 tons in four days at a cost for labor of \$75, or 58 cents per ton capacity. There was no other charge except for man and tractor labor. This silo was drained by a short length of 3/4-inch pipe with a strainer over the end and the bottom of the silo was kept dry without pumping or dipping. The quality of the silage has been as good as any ever seen by the writer, the aroma being particularly mild.

As the location of the first two silos was such that they could not be ditched for drainage they presented a problem in taking care of the accumulating water until we tried the very simple expedient of boring a hole in the bottom and letting the water drain off. In the bottom of the silo at one end we bored with a well auger into white sand at a depth of twenty-three feet. The water was then turned into the well through a pipe with a screen strainer on the end. This was a severe test as there was about eight inches of water in the bottom of the silo at the time and two inches of rain fell during the following twenty-four hours. In spite of this excessive amount of water the well drained the silo and takes the seep water off in a steady stream. In wet weather the seep amounts to a steady stream about one-half inch in diameter.

The original silo has some seepage and a well was bored in the bottom of it, striking sand at 15 feet. This well was bored by

three men in three hours. The first well required eight hours to bore. Well augers are available in every neighborhood and in the Gulf Coastal Plain where sand is struck at a depth of 20 to 40 feet the drainage of the trench silo is very simple and inexpensive. The solution of this problem removes the limitation of location. Drainage can be secured where the water table does not rise above the bottom of the silo.

It first appeared that the trench silo would be particularly valuable for beef-cattle production as beef cattle do not require winter shelter in this region and the silo could be dug near the fields in any place where drainage could be obtained by gravity or where seepage did not occur, and the cattle could be fed in the fields. However, for convenience in feeding dairy cattle the silo should be as near the barn as possible and most such locations will require the drainage well in the bottom of the silo. Surface drainage is easily accomplished by ditches and with bottom drainage there appears no reason for having a roof over the silo. This would add greatly to the cost of the silo and would be more trouble than it would be worth. The direct rainfall seeping through the silage will keep it moist and in good condition for feeding. Many stave silos are not roofed and the silage takes up all of the direct rainfall.

The only practical objection to the trench silo raised by the hundreds of people who have seen ours was the handling of the water accumulating in the bottom. This objection has not been overcome. There are many advantages of this type of silo over other types, the chief one being the economy of construction. Any farmer who has a team and plow can borrow a slip scraper and dig the silo at odd times. No materials need be purchased and no skilled labor is required. With proper care in filling no spoilage whatever occurs. The silo is storm proof and does not depreciate rapidly in use. In four years use at McNeill the only labor required for maintenance has been to clean out the bottom before filling. No serious caving has occurred and any slight caving that might occur is not really depreciation as the smoothing up of the walls would add to the capacity of the silo.

Less expensive machinery is required for filling and much less power as the silage does not have to be elevated. With the combined binder and cutter the cut silage can be hauled to the silo and dumped in. Where filling machinery is available in the neighborhood, trench silos can be dug narrow and filled for the feeding of a herd of only five or six cows. The above-ground silo was not adaptable to the small herd.

More than 100 trench silos have been dug in Mississippi and no failures have been reported. One has been reported from North Carolina and one from Havana, Cuba.

WHAT'S NEW IN THE STATES.

Alabama

Augustus Forrest has been appointed an extension animal husbandman effective August 1. Mr. Forrest succeeds R. S. Sugg who recently resigned.

Florida

Walter J. Sheely was appointed leader of the animal husbandry project, effective August 22. This State has been without a full-time worker in this field for several years.

Idaho

John T. Montgomery, part-time field animal husbandman, has resigned to accept a full-time position of similar nature with the Indian Service.

J. E. Nordby is assisting Mr. Rinehart, field animal husbandman, especially with 4-H Club activities.

Indiana

The first annual Indiana summer show and sale of 4-H Club lambs of market type was held July 1 and 2 at the Indianapolis Union Stock yards. There were 152 lambs entered, all of which were of good quality as evidenced by the sale.

One pen of three lambs sold for 31 cents, which topped the sale. Three pens brought 30 cents and the top pen of five was bid in for 28 cents. The total amount of the sale was \$1,450.13.

The reason for establishing a summer show and sale for 4-H Club lambs is that club members could not sell their lambs to best advantage on the market and still keep them for the fall club shows. Under this new plan the fall shows will provide classes for ewe lambs judged on breed type, instead of as market lambs as in the past.

Louisiana

Representatives of commercial feed companies and agricultural extension livestock specialists met at the college in July for the purpose of getting better acquainted and discussing the problems confronting the livestock raisers of this State. The aim of this meeting was to get all field workers in harmony with the recommendations made to the livestock producers on the fundamental principles allied with feed operations.

The livestock specialists outlined their general plans of work, and the feed company representatives were asked to compare these with their policies.

The feed people requested that a similar meeting be called in January, 1931, which would indicate that they were well pleased with the idea of cooperation sought by the extension workers.

The first meeting of this nature in Louisiana was held in 1927. -- M. M. LaCroix.

Missouri

We had a total of 81 entries in our hog-production contest this year but a lot of them dropped out due to unfavorable weather conditions. However, about twice as many will finish as did last year. The following are the records of three of them:

Records of three entries in hog-production contests

	Blaine McCoy Pike Co.	Harley Kerr Scotland Co.	Henry Mills Caldwell Co.
Number of sows - - - - -	13	14	9
Number of pigs marketed - - - -	108	134	80
Weight per litter, 180 days - - -	2,074.4	2,058	2,073
Weight per head, 180 days - - -	249.7	215	233.3
Feed per 100 pounds gain:			
Corn - - - - -	6.5 bu.	5.56 bu.	5.11 bu.
Protein supplement - - - - -	24	54.6	25.7
Shorts - - - - -	8		60
Pasture - - - - -	30¢	30¢	20¢
Feed cost per 100 pounds gain-	\$6.80	\$6.60	\$6.45
Estimated labor, interest, and marketing costs - - - -	\$1.60	\$1.60	\$1.40
Date of final weight - - - - -	Aug. 7	Aug. 5	Aug. 27

We believe that a total of over 36 ton litters produced by three men is very good considering the drought and hot weather. Pastures have been at very low ~~ebb~~, which ran up the costs for protein supplements. McCoy used tankage and linseed meal in proportions of 2 to 1. Kerr used some pig meal up to the time his pigs weighed 80 pounds; from then on he used tankage and linseed oil meal. Mills used meat meal. Corn for McCoy and Kerr was figured at 80 cents per bushel and for Mills at 90 cents. All three lots sold at the extreme top of the market for the days on which they were sold. --J. W. Burch.

North Carolina

I. I. Case was appointed extension animal husbandman effective September 15. Mr. Case will devote the major part of his time to beef cattle and sheep.

Oregon

Rodent Control on Range. - Poisoning squirrels on 500,000 acres of range land has been carried on for the fifth year in Lake County. This has been done in cooperation with the Biological Survey, the county agent, and local stockmen. The results have been very satisfactory and the range has been very much improved by this campaign. There has been no difficulty in getting all the cooperation necessary from the local stockmen who are loud in their praises regarding the improvement of grazing conditions since this work began. Funds are in sight to continue the work another year.

Lamb Pools. - County agent H. G. Avery of Union County started lamb pooling this year. He was later joined by county agents N. C. Donaldson of Wallowa County and Roger Morse of Baker County. Close to 20,000 lambs were pooled under the same plan as carried on by E. F. Rinehart of Idaho.

The Oregon pools netted the grower from a cent to a cent and a half above home price. Most of the lambs were sent to Omaha. The sorting was done by a local committee. The plan was to take only good, fat market lambs. The results of this work have been very gratifying and plans are under way to carry it on in other counties next year.

Lamb Grading Demonstrations. - The extension service has been staging lamb-grading demonstrations on farms. The growers are taking very kindly to this type of work. They are learning to sort their own lambs to better advantage and are thereby enabled to realize more money for them. -- H. A. Lindgren.

Texas

John H. Jones was appointed assistant animal-husbandry specialist effective September 1.

West Virginia

As a part of the West Virginia sheep-extension program "To Make the West Virginia Market Lamb Supreme," a purebred ram sale was held at Lewisburg on September 5 under the auspices of the West Virginia Purebred Sheep Breeders' Association. This was the first sale of its kind to be held in this section of the State.

As a preparation for this sale, the county agents in this section took orders from a number of farmers who wanted to purchase a good purebred ram. In giving their orders they stated the age, price and quality of the ram they wished to purchase. The orders placed in advance of the sale insured a large number of rams for delivery. In addition to these, about 30 surplus rams were brought in for the sale and sold at private treaty.

The C. & O. Railroad Company and the Jersey City Stock Yards Company cooperated with the management in taking care of transportation of rams shipped in and also the cost of feed and other incidental expenses connected with the sale. The West Virginia Department of Agriculture and the Agricultural Extension Division of the West Virginia University took care of the expense of selecting the rams and holding the sale. The rams were sold to the farmers at actual cost, thus making a saving of from five to seven dollars over what they would have had to pay had they gone out in the open market for them.

There were 18 Shropshire rams sold, 14 Southdowns, 10 Hampshires, 7 Dorsets, and 3 Cheviots, making a total of 52 rams.

The plan is to hold a similar sale in the Greenbrier Valley again next year. -- B. F. Creech.

Hawaii

H. L. Chung is the extension animal husbandman in this far distant land. His address is Agricultural Extension Service, University of Hawaii, Honolulu, T. H.

WORDS

News writing is supposed to tell something. Here is an example - a horrible example, one may hasten to add - held up to scorn by Russell Lord, and tells nothing:

"A good sized crowd was in attendance at the farm bureau meeting held here Saturday. State speakers were in attendance and delivered addresses that were both inspiring and instructive.

"A well-arranged program had been prepared for this occasion, and no part was omitted. The gathering was enthusiastic from beginning until the close and bespeaks progress for the organization in the future. Many subjects were thoroly discussed that will prove af benefit to everyone. The county farm bureau has reached a magnitude of importance in the community, and there isn't any doubt that such an organization will prove beneficial to its members and the community in general."

Lord's comment on this is that "There seems to have been a meeting." It is an all too-frequent specimen of the word habits into which extension workers are all too likely to fall. In short, it is just a collection of words, and nothin' else but!

— New York Extension Service News

1930 CENSUS DATA

State and county summaries of livestock and other agricultural information are now being released by the Bureau of the Census. Extension workers and others interested may obtain such reports as released by writing to the Bureau of the Census, U. S. Department of Commerce, Washington, D. C.

MICHIGAN'S SHEEP IMPROVEMENT PROGRAM

by

Delmer H. LaVoi, Extension Specialist in Animal Husbandry,
Michigan State College

Since sheep-extension work was started in Michigan by V. A. Freeman it has made continuous growth. With a total of 1,339,000 sheep, the State ranks second in sheep numbers among the States east of the Mississippi River, or next to Ohio. Most of the flocks are small in size and have been returning to their owners around \$11,000,000 annually from wool and mutton.

Michigan has certain natural resources which makes it adapted to sheep raising. Large areas of available pasture land, with plenty of shade and running water and good growths of leguminous grasses favor sheep production. What it lacks, however, is more efficient methods of breeding and handling sheep, as the quality of some of its flocks could be considerably improved. Other breeders need to adopt new practices in loss prevention, while still others new in the business need help in getting adjusted. Our extension program is arranged in such a way that all possible help may be given both the beginner and the man already in the business in improving their flocks and in increasing their profits.

Nearly every county in the State is carrying on some sheep work and the program is of general interest. Close harmony exists between the county agricultural agents and the various other organizations which have a personal interest in our projects. All requests for extension work within the counties come either directly from the county agricultural agents or from the county club leaders. These requests are increasing each year in line with the magnitude of the sheep business.

At the present time our extension program in sheep work centers around a series of three seasonal meetings, namely that of flock improvement in the fall, feeding and winter management during the winter months, and parasite prevention and wool meetings in the spring. This year the new Wolverine Lamb Production Contest was started to relieve the monotony of repetitive meetings and to give a method of measuring results as well as a way of obtaining data on

the way sheep are handled and managed in the State. Contests of this kind will mean considerable to the sheepmen in the State and the data obtained can be used in many useful ways in our extension program.

Closely following other phases of our work was that conducted through the Lamb Improvement Contest on docking and castrating in which 32 counties in the State are competing for State and national prizes. A number of tours which are of interest to both breeders and the lamb feeders are organized and conducted each year. This is another method of making it possible for others to improve through seeing good flocks under proper management.

At our fall series of meetings actual demonstrations are conducted in ewe culling, lamb grading, judging, selection, etc. These meetings are arranged by the agricultural agents. They receive posters and publicity from the extension department for use in connection with the meetings. At these meetings flock improvement is stressed through the use of purebred rams. To facilitate the purchase of rams especially in the northern part of the State where breeders are very scarce, the Michigan Pure Bred Sheep Breeders' Association has been sending a truckload of purebred animals to be present at the series of meetings.

The State Ram Truck, as it is commonly called, is now considered an essential part of our fall meetings and it serves as a feature in our program in sheep work. The rams taken on the truck are personally selected by the secretary of the Sheep Breeders Association and a representative of the extension department. A number of the rams have been sold on advance order and are delivered at the meetings. The county agricultural agents who have prospects for rams get written orders and send these in so that personal selections can be made in regard to particular individual characteristics.

To stimulate more interest in the placings of rams in the different counties a number of the cooperative livestock shipping associations are offering small cash prizes to be given to the county agent who places the most rams in his county in proportion to the number of sheep raisers. Rams taken on the truck are generously consigned by breeders from all parts of the State, although they know previously that the individuals which are not sold will be returned. Trucking expense of \$5.00 or slightly more is charged to the sale price of the ram. Yearling Hampshires, Oxford, and Shropshires are most in demand and individuals of other

breeds are taken on order. Last year the truck covered 2,400 miles, was out 20 days, and was present at 38 meetings during which time 104 rams were placed.

Plans are now under way for the fall meetings. A variation will be tried this year inasmuch as a few of the county fairs have requested that we have our ram-truck meeting as a special feature of that day's program. This program is being worked out cooperatively between the county agricultural agents and the fair Board officials. Special prizes are being offered which is creating considerable interest and it is thought that a larger number of people will be benefited by the meetings. Most of the other meetings are held at farms where ewes and lambs are available. Since the ram truck was started three years ago a difference in the quality of flocks is already noticeable. Purebred rams are scarce, and the new breeding stock introduced along with the better practices now being used are beginning to show results and will continue to do so in the future. The various breeders in the State are also pleased as it allows them a way to dispose of their surplus to good advantage.

The winter series of meetings on feeding and care and management are usually conducted as informal gatherings, where plenty of time is given to discussion. Charts and other material are used to suggest topics of interest to the group. This year we are supplementing these winter meetings by announcing the results of the new Wolverine Lamb Production Contest. Using individual contestants who have made a success and by showing their practices and systems of management, will add a personal element which will greatly stimulate the interest of the breeders in the State.

Most of the spring series of meetings are conducted as demonstrations and they are proving exceedingly popular. Nearly every sheepman has certain losses that can be prevented, most of which in the past have been from internal parasites. Since drenching demonstrations were instituted more interest has developed in this work, as flocks treated have shown improvement. The treatment recommended and used in demonstrative work is the copper-sulphate black-leaf-40 mixture. We are encouraging drenching as a regular preventive practice and a number of our breeders are now drenching their sheep every four to five weeks during the summer months and they agree that it is showing good results. Considerable docking and castrating is also done at these series of meetings. It is surprising how many sheepmen fail to perform this practice, due to a belief that it is difficult. Later in the season, after shearing time, a number of demonstrations are conducted on dipping. Tanks and drain boards are provided and every step is made to give those

in attendance an idea of the ease and lack of danger in dipping sheep. Many of our breeders are using Cooper's Dipping Powder which when used with precaution is proving very satisfactory. It is our plan at all of these meetings to get those in attendance to do the actual work.

The wool work that has been done has been of interest as many of the sheepmen admit that they pay very little attention to the marketing of this product. Such topics as tying, packing, grading, and the general care of fleeces have taken very well. Information is necessary on the general care of wool showing that more attention needs to be given this product if better grades and higher prices are to be received.

The new Wolverine Lamb Production Contest should encourage all the improved practices and give us definite data as to the value of these improved methods. This contest is similar to that conducted in the other States. We base our results on the average number of pounds of lamb that can be produced per ewe in 135 days. One hundred and fifty-three sheep raisers are entered and considerable interest is being shown. By prorating the flocks and allowing those of larger size a few pounds of lamb per ewe extra, we have been able to put all the flocks into one group, thereby making our prizes higher and adding more general interest. We find that a total of 6,917 ewes are included in the contest and that they represent flocks from 45 counties in the State. These flocks range in size from 20 to 265 ewes, six of which are over 150 in number. Visits have been made to each of these contestants and valuable data are being collected on their practices and systems of management. The county agricultural agents are cooperating very generously and through their efforts most of the enrollments were received. Each of the individual contestants are now acting as local demonstrators and the various communities are much interested in the outcome of the contest. Results will be tabulated and placed in publication form.

Thirty-two counties are entered in the Lamb Improvement Contest on docking and castrating. Although not a great deal of improvement can be shown in some of the counties their agents believe the work is worth while. In some counties the assessor or board of supervisors gave valuable help. In others local leaders, Smith-Highes agricultural students, interested breeders, newspapers, and others gave a helping hand. Some meetings were conducted where local leaders were trained and they in turn passed the information on to people in their community. The ultimate success of this work goes to the agricultural agents in the various counties, some of which have given much personal time and attention to this matter and they are satisfied that the results gained in increased profits and in pride have been more than worth while.

A number of the counties have been conducting particularly good sheep programs. Gasper Blumer, county agent in Alcona County, has been doing some effective work in connection with sheep parasites. First he set out to have every flock in the county drenched, then last spring his plan was to do the same in regard to dipping. Most of his meetings have been cooperative ones in which the neighbors helped one another. A number of rings are formed and the work is not considered finished until the ring is completed. This worked out particularly well with dipping, as the flocks were driven to one central point which cheapened the cost and shortened the time for doing the work.

Ralph Traftlet, Osceola County agent, has also been devoting considerable of his time to sheep work. He too, has believed in improving his county flocks by encouraging drenching. These two county agents have the most enrollments in the Lamb Production Contest and have been doing effective work in all lines of sheep production.

B. C. Mellencamp and A. R. Schubert of Charlevoix and Emmet counties, respectively, have been in close contact with their sheepmen. Numbers of purebred rams have been introduced into these counties. H. L. Barnum, Ralph Biebesheimer, Jess Huggett, and James Gorsline are all doing effective work by using news letters to supply their breeders with timely information. All in all most of the agents in the State are doing something or another to improve the flocks in their counties.

A very fine spirit of cooperation exists and much valuable help is being given by the Michigan Pure Bred Sheep Breeders Association and the Michigan Lamb Feeders Association in our sheep program. The secretary of the former, M. H. Thornton, Shepard, and Professor George A. Brown of Michigan State College have given generously of their time by attending meetings and doing other work in connection with Michigan sheep breeders.

We plan to broaden our program another year by working with lamb feeders to collect data on costs. This is to be worked out in a cooperative way. Lamb grading and construction of concrete dipping tanks are other projects which we hope to start next year.

We believe that Michigan is due to expand in the sheep business, owing to natural resources. The lamb feeders who are forced to purchase lambs from outside the State at the present time, because of risk of internal parasites may look to local supplies when the flocks have been improved through better breeding and parasite-control measures. When this time arrives we believe our extension methods and program will show decided results.

FEEDING WHEAT TO BEEF CALVES

by
D. E. Richards, Livestock Specialist,
Montana Extension Service

Montana is a mighty big State but we can not brag very much about that because two States in the Union are still larger. The point is that within the boundaries of a big State are widely different conditions. Most of the range in eastern Montana is adapted to raising 3 year old steers, and these steers will always be sold "fat off the grass." In our "Big Hole" country which is a well-irrigated valley, some 42 miles long and 12 miles wide producing an excellent quality of wild hay, a good many carloads of cattle, mostly 3-year-olds are fattened each winter on hay—just hay—but the cattle get fat.

Contrasted to these areas we have a number of irrigated valleys that produce a surplus of hay in normal years. For the last two years we have had a surplus of wheat and the price permits its use as a feed for livestock. Montana often has "frosted wheat" as well as "shrunk" wheat, and as feeds for livestock they "can't be beat in Montana," as demonstrated by our experiment station.

It was the job of the extension service to get the information out to cattlemen that wheat was the best feed available here, and that there was a good opportunity for the fattening of some cattle in this State. Some cattlemen had already been discouraged from fattening cattle on account of the "bloat" and losses occurring from attempting to fatten cattle on barley. It was another part of our job to demonstrate that wheat did not cause as much bloat as barley.

How were we going to get this information disseminated?

As usual, when we really want to get things done, we consulted the county agents. After the usual amount of "cussing" and discussing it was agreed that the best way to get this job done was through a generous lot of "Boys' 4-H Baby-Beef Clubs. This was our first serious start in 4-H beef-calf club work and ten of the agents tackled this project and as a result some 200 boys are feeding from 1 to 3 good-quality beef calves and will show them at

our district and county fairs this fall. These 4-H Baby-Beef Clubs were not only started to give the boys the regular training and experience that comes from fitting and showing a calf but also to serve as demonstrations of proper methods of feeding as recommended by the Montana Experiment Station.

When the instructions went out to these boys that wheat was the best grain for fattening calves, the "Dads" of these boys as well as the neighbors took the instructions, if at all, with a "grain of salt." But the calves are eating wheat, getting fat, and making good gains. A few of the boys that insisted on feeding barley did so, but some of them at a loss. Four of the calves fed barley bloated and "went over the hill" but these calves were insured so that the boys received \$65 to \$75 for them.

We will agree that last year was not a very good year to start feeding work, for calves were high last fall and so was the feed, but we are all agreed that these boys have demonstrated that wheat is an excellent feed for fattening calves. This fall with low-priced cattle and cheap wheat we will have a good many more demonstrations started than last fall.

We could mention a few more things telling how the spread of influence from these beef-calf clubs up in "Scotty" Cameron's county, for instance, has been responsible for the putting on feed seven loads of cattle that will be fattened on wheat this winter. We could also mention that over at the Lewistown Fair in Central Montana this year, one of the main attractions in the beef cattle barns was County agent Bill Jones' string of boys and their calves. We could mention what our other agents are doing but the story would get too long, so here is to more wheat feeding in Montana this winter.

REPORT OF REPLACEMENTS IN VIRGINIA BETTER SIRES PROJECT

<u>Year</u>	<u>Beef Bulls</u>	<u>Rams</u>	<u>Boars</u>	<u>Total</u>
1924	53	40	36	129
1925	57	64	21	142
1926	95	62	33	190
1927	88	76	31	195
1928	81	51	13	145
1929	<u>108</u>	<u>78</u>	<u>15</u>	<u>201</u>
Total	482	371	149	1,002

-- From Virginia Annual Report, 1929.

COLORADO PLAN OF LIVESTOCK EXTENSION WORK

by L. H. Rochford, Extension Animal Husbandman,
Colorado Agricultural College

There has been much discussion of the lack of coordination between extension and experiment station programs. Probably, we are all agreed that there should be a closer cooperation between these two groups, and that each should have better understanding of what the other is trying to do. Putting it in another way, is it not the duty of the extension worker to take the results of the experiment stations and give them practical application under typical ranch or farm conditions? Also, it seems that the extension worker through his constant contact with producers' problems should be in a position to help experiment-station workers in planning practical investigational programs.

In Colorado we have made a special effort to bring about a closer relationship between the work of the animal husbandry research men and that of the livestock extension forces. We believe that the effort has been well worth while, and that the service to the livestock producers has thereby been improved.

In the first place, our livestock extension programs are based on the recommendations made by livestock committees at district economic conferences, and on the advice of livestock associations of the State. The extension animal husbandman then confers with the head of the animal husbandry department and the chief of the experiment station section for their suggestions and approval of the livestock programs.

To best meet the demands for definite livestock work comparisons in the field are sometimes necessary. In such cases the experiment station workers advise with us as to the set-up and methods of procedure. They usually assist at the field days where results are announced. As an example of this, last year we conducted a lamb-feeding demonstration in the Arkansas Valley district on the ranch of Geo. B. Long, a successful and extensive lamb feeder. The demonstration involved a comparison of a beet by-product ration with a cut-mixture ration. Several years' work at the experiment station has shown the advantages of the beet by-product ration over the cut

mixture. Although the beet by-products have been available in the Arkansas Valley for several years, little use had been made of the standard ration. The object of the demonstration, therefore, was to bring out not only the advantages of the beet ration but some of the important details in feeding such a ration. Mr. Long furnished the lambs, feed, and equipment; county agent Lamb made the first arrangements for the demonstration, was responsible for the data, arrangements for the field day, etc. The extension animal husbandman and E. J. Maynard of the animal investigations section worked out the set-up of the demonstrations, sorted and weighed the lambs, summarized the final results of the test and assisted in the field-day program. The Southeast Colorado Stockgrowers' Association sponsored the field day and had charge of the program. A total of 125 practical stockmen came to see and hear the results.

Sometimes, there is need for field tests involving comparisons of feeds or methods that still are in the experimental stage and backed by neither experimental evidence nor practice. Such field tests are conducted by the experiment-station workers or jointly by the experiment station and extension service.

Wherever possible, the livestock-extension program has been centered around definite demonstrations that seek to show improved livestock practices. In every case, we have endeavored to locate the demonstrations on typical ranches or farms situated in key positions. Wherever a stockmen's association has existed, they have given excellent cooperation and sponsored the field days. The advice of the association has been sought on location, methods, and type of work. It is true that this plan may not place the extension animal husbandman in personal contact with as many stockmen as if he were to work more by individual visits or through general meetings. However, stockmen have time and again indicated that they are not so much interested in general meetings and theoretical advice. They want to see definite results obtained under local conditions. Therefore, we believe that the demonstration plan has best served both the cattle and sheep interests of the State. Stockgrowers and associations are continually asking for more of the demonstration type of work. Seldom do they request a general meeting.

Where there is a local county agent, all demonstrations are planned with his cooperation. He is responsible for accurate data, arrangements for field days, etc. We have found that in some cases the demonstrations give county agents contacts with their stockmen that they did not have before. In a few cases where there are no

county agents, contacts are made directly through local stock-growers associations.

There is another matter of perhaps minor importance but one worth consideration. In this State, the extension animal husbandman maintains his office in the department of animal husbandry at the agricultural college. Such an arrangement brings the extension man into closer contact with college and experiment station workers.

NO PASTURES IN THE WIND

When I was once in Baltimore,
A man came up to me and cried,
"Come, I have eighteen hundred sheep,
And we will sail on Tuesday's tide.

If you will sail with me, young man,
I'll pay you fifty shillings down;
These eighteen hundred sheep I take
From Baltimore to Glasgow town."

He paid me fifty shillings down,
I sailed with eighteen hundred
sheep;
We soon had cleared the harbor's
mouth,
We soon were in the salt sea deep.

The first night we were out at sea
Those sheep were quiet in their mind;
The second night they cried with fear--
They smelt no pastures in the wind.

They sniffed, poor things, for their
green fields,
They cried so loud I could not sleep;
For fifty thousand shillings down
I would not sail again with sheep.

— W. H. Davies

BETTER-SIRES WORK IN KENTUCKY

by

Wayland Rhoads, Field Agent in Animal Husbandry,
University of Kentucky

A comparison of recent surveys made in a number of counties in Kentucky with those made in 1920, shows that the number of purebred sires in the State has more than doubled in this ten-year period.

During this period Kentucky has also made rapid progress in enrollments in the "Better Sires - Better Stock" campaign. At the present time with over 3,500 livestock producers who have agreed to use purebred sires, Kentucky leads any other State by over 500 members. All grade and scrub bulls have been eliminated from three of our counties. These are Union, Russell, and Taylor counties. Six other counties have nearly reached this goal. Yet there are some counties that have only a very few purebred sires in them.

Our procedure in holding better-sires campaigns is as follows:

1. We first make a survey of bulls in a county. This survey is made by a livestock committee or by a representative in each school district. Sometimes the school trustee does this. Information is obtained as to the number of purebred, grade, and scrub bulls in the county.
2. We hold a meeting, usually at the county seat, of leaders to decide if a better-sires campaign is desirable for that particular county at that time.
3. We have publicity in the local papers for six weeks prior to the campaign. County papers are usually glad to assist in the work. Better-sires articles are furnished by the State College of Agriculture.
4. We compile a list of purebred sires and prices for same. It is advisable to have purebreds listed which are available in the county, as well as nearby counties. If there are enough bulls available and the committee and the bull owners consider it advisable, a sale is held in the county at the close of the campaign.

5. During the campaign we attempt to have enough meetings to reach all parts of the county. It is a good plan to start off with a meeting of the leaders and workers, either the first day or first night. Usually this is held at the county seat and often a Rotary or Kiwanis club or other group of business men give a dinner for the occasion. At this meeting the plan of work is discussed and instructions are given to the leaders. At the meetings held in the county, the value of purebred sires is shown. Either lantern slides or motion pictures of better livestock are shown. We enroll as members those eligible to receive the better-sires certificate at these meetings.

6. During the day we visit those men who own or have grade or scrub sires. These men should be visited along with the local livestock leader in that district. If possible we induce these men to dispose of their grades and scrubs and buy purebreds. These daily visits usually work best in the territory where the meeting has been held the night before.

7. If local conditions warrant we finish the better-sires drive with an all-day picnic and stock show. Speeches on livestock problems are given. A scrub-sire trial should be part of the program for this day. The fair grounds of some local picnic grounds is a good place for these meetings. The scrub-sire trial can very conveniently be held at the courthouse if the all-day picnic is not held.

8. We make arrangements with local livestock producers for enough purebred bulls to supply the county in the future, if the county is not already doing this. More purebred sires would be bought and used if the source of supply were nearer at hand.

If a campaign has been held previously, the meetings need not be duplicated. The survey should be made, however, and also visits to the owners of grade and scrub bulls in order to induce them to get rid of same.

The State specialist assists agents in planning better-sires campaigns and meetings; prepares and secures material for use in publicity work on the project; furnishes a supply of posters, circulars, and bulletins on better-sire work; takes part in the campaign; assists agents in obtaining purebred sires; assists agents in eliminating scrub sires and enrolling better-sires members;

furnishes exhibit material in better-sires exhibits to be used at county fairs.

The county agent makes the survey of purebred, grade, and scrub bulls in his county; calls a meeting of central livestock committee to discuss better-sire work; plans with this committee the campaign in the county and conducts the campaign.

OHIO CATTLE FEEDERS' TOURS

Nine counties held tours this year which were attended by a total of 818 people. Most of the tours were followed by a banquet in the evening, although not all counties followed this plan. In most of the counties considerable preliminary work was carried on ahead of the tour, several feeders in each county being secured to keep records on their feeding operations. Such records are then summarized just prior to the tour and the results are put out on mimeograph sheets on the day of the tour. Most of the tours took place only in the afternoon, the banquet following in the evening, although two counties held all-day tours. It is believed that the half-day tour is the most successful because those interested are more willing to come out for a half day than a whole day.

Three or four different feedlots are usually visited in the afternoon and at each stop the farmer-feeder gives an outline of his operations, telling when the cattle were put in, what their weight was at the beginning, and what the cattle cost. Then he gives a resumé of his feeding methods and his summary of the cost. His explanations are then followed by an estimate of the market value on the cattle. This estimate is placed by one or more stockyards commission men. In this way those attending have a chance to check up on the profit or the loss of the venture. The same program is followed at each stop, and in lining up the places visited, an attempt is always made to get a considerable variation in the feeding methods used and the type and weight of cattle being fed.

— From Ohio Annual Report, 1929.

NEBRASKA PIG-CROP CONTEST

Last spring, 68 men entered the contest. Only 35 completed and of this number only 25 made their 1,000-pound goal. (Average weight, at 6 months, of all litters produced.) Every man, in discussing the contest, agreed that he had learned a real lesson. Some learned how well they were going, more learned how poorly they were doing, and all learned that careful attention to all the details regarding feeding and disease prevention was absolutely necessary to success. Meetings are being planned for communities where hog men completed with outstanding records.

No tempting prizes are being offered to the participants as it is feared that to do so will tend to stimulate a competitive spirit that will result in less accurate but more outstanding records. The records are made for one purpose only -- that of studying one's own business and comparing it with records of other producers in the hope of improving methods of production. Comparative records of the five high and five low farms in the contest together with the general average follow:

Comparative results of pig-crop contest

	<u>Average of 32 farms</u>	<u>Average of 5 high farms</u>	<u>Average of 5 low farms</u>
Average feed and labor cost			
per cwt.....	\$6.80	\$6.33	\$9.14
Average cost per pig.....	\$12.80	\$12.80	\$11.11
Average weight of all pigs			
raised, at 6 months.....	188 lbs.	202 lbs.	122 lbs.
Average weight of all litters			
produced.....	1,141 lbs.	1,590 lbs.	615 lbs.
Average number of sows per farm...	14.9	8.8	11.2
Average number of pigs raised			
per sow.....	6.1	7.9	5.1
Average number of pigs far-			
rowed per sow.....	8.3	10.4	7.2
Average percentage of farrowed			
pigs raised.....	73 %	76 %	70 %

The above costs include only feed and labor. The hog producer has interest on investment, depreciation of breeding stock and equipment, and other miscellaneous charges.

-- From Nebraska Annual Report, 1929.

THE SHEEP INDUSTRY IN INDIANA

by
Claude Harper, Purdue University

Sheep production in Indiana is a part of a diversified farm business. Sheep are raised on one-fifth of our farms, but not successfully on all of them. Its success depends on a rather full recognition of its handicaps.

The two outstanding limitations to sheep production in Indiana are the competition of other farm animals for feed and pasture and the limited amount of legume hay for winter feed. Still other handicaps are limiting factors in some sections, and on certain farms. Among them are: External and internal parasites; predatory animals, especially dogs together with lack of sheep-proof fences; the failure of many farmers to meet the market requirements of a prime lamb and a desirable wool clip; losses of lambs during the lambing season and losses of ewes sixty days prior to lambing; a poor and inadequate source of desirable breeding rams in certain sections; the fact that sheep do not return a weekly or monthly income, and a deficiency of information on the part of beginners of the fundamental principles of feeding and management. When growers consider sheep strictly as scavengers on a farm their operations usually prove unprofitable.

All these limitations or handicaps can be successfully controlled except a frequent income from sheep and the competition of other farm animals for feed and pasture. The question of a regular income applies also to all other farm products except poultry and dairy cattle.

Competition on the Farm

When flocks fail to receive their full share of feed and attention on the farm, it is usually traceable to the competition of other classes of animals. Sheep and beef cattle are direct competitors for feed. Both are large consumers of roughage and pasture and small consumers of labor. They differ in only one respect so far as feed is concerned. Sheep need some legume roughage in their winter ration.

Sheep and dairy cattle are competitors for pasture and legume roughage in winter. If there is a surplus of feed, however, it is

usually legume hay. Since their relations relative to the use of labor are directly opposite, small flocks of sheep are finding a place on many farms where dairy cattle are kept.

Sheep and swine are not competitors for feed on the farm. Swine consume large quantities of concentrates and small quantities of roughage. The opposite situation prevails with sheep. They are competitors for labor during the farrowing and lambing season on most farms. Sheep require more labor at lambing than any other time during the year. A swine producer finds sheep profitable and not a handicap in his diversification program, if he will but supply them with a liberal amount of legume hay in winter.

In Indiana, approximately two-thirds of the income from a flock of sheep comes from the lambs produced and the other one-third from the wool clip.

Value of Legume Hay

For economical production and the maintenance of thrift and health, sheep and lambs must have some legume hay in their ration in winter. The amount may vary from 100 per cent of the roughage to only 10 per cent, depending upon its cost or availability.

Sheep are roughage consumers and legume hay is not a cheap feed. Maximum use of pasture crops in spring, summer, and fall, and corn silage in winter reduces production costs.

Diseases

The presence of parasites, both external and internal, results in more unthriftiness and losses in sheep and lambs in Indiana than any other cause. Happily, parasites for the most part are controllable.

Hundreds of Indiana ewes die during pregnancy and many of these losses are due to paralysis. Most of these losses occur within 60 days prior to lambing.

The losses of lambs at lambing time are usually traceable to mistakes in feeding and handling the ewes during pregnancy and after lambing. Growers generally fail to recognize that many ewes do not have the ability to suckle more than one lamb, regardless of how they are fed.

Predatory Animals

Legislation has never solved the predatory-animal problem. Dogs furnish the largest predatory animal problem in Indiana, while wolves and foxes play a minor role. The dog problem is best solved by housing the sheep and lambs nightly in dog-proof corrals, together with good legislation relating to the control of dogs.

Fences for Sheep

In most of the unfenced hill sections of Indiana the cost of fencing, in order to graze sheep, is not justified. Even in some areas that are fenced one finds a large dog population or other deterring factors. In the unfenced prairie sections these conditions do not prevail and if sheep fit into the system of farm management, the expenditures for sheep-proof fences may prove justifiable.

The Growers

Too often owners of grade ewe flocks of 10 to 25 head consider such flocks of secondary importance on a farm. Their investment often is small compared with the investment in other enterprises on their farm. Such flocks can withstand more neglect than larger flocks because they usually have sufficient land over which to graze that they are not apt to be badly infested with internal parasites.

Grade ewe flocks that range in size from 30 to 100 or more head are less often neglected. Owners of such flocks attempt to follow a method of producing lambs that seems to fit best in their scheme of farming. In such flocks, in addition to the milk the lambs get from their mothers, lambs are produced on harvested feeds, a combination of pasture and harvested feeds or on pasture crops alone. Although there are many methods under which prime market lambs can be produced profitably there is nothing that produces larger and cheaper gains on lambs than green pasture in the field and a liberal supply of milk from the ewes.

Experienced farmers who produce purebred breeding stock or fatten range sheep and lambs usually consider their sheep operations a major part of the farm business and are alert to new economics in production and marketing.

The Topography of the Land

The type of soil or topography of the land apparently has

nothing to do with profitable sheep production in Indiana except on strictly sandy soil and nonproductive land. There are growers producing sheep profitably on black prairie soil, muck, sandy loam, clay, on level land, rolling areas and the extremely hilly sections of the State, but always on productive farms. Sheep do not remain long on farms that fail to supply some legume hay or an abundance of bluegrass pasture for winter feed.

Sheep Reduce Labor Costs

The public generally and inexperienced producers have come to look upon sheep production as a business that requires little feed and no labor. Unfortunately, this exaggerated idea has been a costly experience for many a new operator. Sheep production does reduce labor costs under certain conditions. Many farmers milk all the cows their labor will permit and at the same time have a surplus of pasture and legume hay. When this situation prevails they find sheep a profitable method of utilizing the surplus feed without greatly increasing labor costs. Mint growers find sheep a cheap means of keeping weeds and grass out of their fields. General farmers like to use sheep to clean the lanes, fence rows and fields of grass, weeds and briars during the summer. Sheep require less labor than any other livestock kept on a farm, beef cattle excepted, but experienced growers hold no idea that sheep require little feed and no labor whatsoever.

A Sheep Extension Program

All phases of our sheep-extension work are designed to remedy situations that limit or handicap the sheep business in the State. Furthermore, they are aimed to inspire growers to rise above their present practices, establish confidence in the industry, form a sympathetic contact with market agencies, manufacturers, packers, and other reliable business agencies interested in the sheep industry.

Members of the Hoosier Gold Medal Sheep Club demonstrate the value of good breeding, feeding, management and market requirements of lambs. Ninety-five per cent of all gold-medal winners have been sired by purebred rams. Lambs must be saved at the rate of 120 per 100 ewes to win a gold medal. The value of docking and castrating has not been overlooked. Market lambs winning gold medals have never failed to top the market on the day sold, and purebred lambs have demonstrated their ability to mature early and rapidly.

Work with sheep associations has brought about improvement in seed stock. Wool-grading demonstrations have taught many farmers

the various grades of market wool, how to interpret market quotations, and the type of sires to select for improvement in quality and quantity of wool produced. Lamb-feeding demonstrations have consistently showed the value of corn and oats for fattening lambs after weaning, the value of protein supplements, such as soybeans, cottonseed meal and linseed oilmeal, the value of a legume hay in the ration, the value of green pasture in summer and fall and corn silage in winter.

It has never been the policy to promote sheep production in localities or on farms where sheep have not or can not be made a recognized part of the farm business. It has been the policy to help the growers that already have sheep with problems relating to breeding, feeding, management and marketing of sheep and their products. Demonstrations, tours, meetings, shows, exhibits, and publicity have been the means of forwarding the sheep-extension program in Indiana.

MORE PUREBRED SIRES

Reports from the county agents show that a much greater number of farmers have been assisted in securing purebred sires in 1929 than at any time during the past four years.

During 1929 county agents in 46 counties have assisted 236 farmers in securing purebred beef bulls as compared with 145 in 1928; 141 in 1927; and 76 in 1926. The county agents in 58 counties of the State have assisted 373 farmers this year in securing purebred boars. And 128 farmers located in 32 different counties were assisted in securing purebred rams as compared with 82 in 1928; 110 in 1927; and 69 in 1926.

The interest in purebred sires work has extended to a greater number of counties during the year. Fifty-eight of the 77 counties of Oklahoma assisted in furthering the cause of better sires in 1929.

— From Oklahoma Annual Report, 1929.

MISSOURI LAMB GRADING DEMONSTRATIONS

Lamb grading has proved to be one of the most effective demonstrations used in connection with the Missouri Plan of Sheep Improvement. It has afforded an opportunity to show the community choice market lambs produced by following the other seven essentials in the Missouri plan in contrast with buck and cull lambs resulting from haphazard practices. It has always been a prevailing condition that the best lambs have been sired by registered mutton rams out of thrifty ewes that had been bred early, properly fed and cared for, docked and castrated, and grain fed. At each demonstration lambs of the various grades were lined up and each farmer was shown how to handle the lambs and given an opportunity to learn the requirements that constitute a choice market lamb. The practicability of this teaching is evidenced by the fact that a number of men watched the grading, handled the lambs, and established the difference between the various grades through questions, then returned home, sorted their lambs, and brought in only those of select and standard grades. In addition to teaching individual producers, special attention was given to training shipping managers and committees of individuals who can later be responsible for grading work. A second grading demonstration in which the grading was done by local individuals, was held in some of the counties.

Valued assistance in teaching grading was given the animal husbandry staff by commission salesmen and packer buyers from the terminal markets.

Aside from being an effective means of teaching methods of production, lamb grading has helped to build a reputation for Missouri lambs at the terminal markets. Packer buyers were appreciative of graded lambs to the extent that they paid \$0.50 to \$1.25 a hundred more for the standard and select grades than was quoted as the practical top of the market. The St. Louis Live Stock Reporter carried some favorable mention of graded lambs on 12 of the 15 days between May 27 and June 21, the period in which the bulk of graded lambs was sold. In discussing lamb grading, producers generally reflected the satisfaction of having produced lambs that met the demands of the market and improved the sheep industry rather than the fact that they received an increased price for their product.

Sixty-three grading demonstrations were held in 31 counties with an average of 65 men in attendance. A total of 12,155 lambs were graded and sold on a graded basis. In every case except on the lambs sold on the market according to the grade made at the local shipping point, there was a smaller percentage of select lambs than in 1928. This was no doubt due to the fact that the continuous rainy weather made it difficult to fatten lambs to a high degree, and that some of the demonstrations were held in the Ozark section where a limited amount of preliminary work had been done.

-- From Missouri Annual Report, 1929.

RECENT PUBLICATIONS

"Lamb Marketing Investigations in Western Oregon," by Lindgren and Potter - Oregon Experiment Station Bulletin No. 265.

"Surface Areas of Sheep," by Ritzman and Colovos - New Hampshire Experiment Station Circular No. 32.

"Wool Production in California," by J. F. Wilson - California Extension Service Circular No. 12.

"Cottonseed Meal with Various Roughages as Fattening Rations for Lambs," by Rufus F. Cox - New Mexico Experiment Station Bulletin No. 179.

"Sheep Club Lessons," by Kenneth E. Litton - Georgia Extension Service Bulletin No. 377.

"Cost of Raising Pigs to Weaning Age," by Hostetler, Nance and Foster - North Carolina Experiment Station Bulletin No. 272.

"Soybeans and Soybean Oilmeal for Pigs," by W. L. Robison - Ohio Experiment Station Bulletin No. 452.

"Nebraska Portable Hog Houses," by Waggener and Wood - Nebraska Extension Service Circular 230, revised.

"The Montana Self Feeder" - Montana Extension Service Circular No. 7.

"Motor Transportation of Hogs to the Indianapolis Market," by James R. Wiley - Purdue (Indiana) Experiment Station Bulletin No. 337.

"Pasture Crops for Swine," by McCarty and Grimes - Pennsylvania Experiment Station Bulletin No. 254.

"Hogging Off Corn," by W. E. J. Edwards - Michigan Experiment Station Special Bulletin No. 200.

"Growth and Reproduction in Swine," by Fred F. McKenzie - Missouri Experiment Station Research Bulletin No. 118.

"Pork Products in Foreign Trade," by Knute Bjorka - Iowa Experiment Station Circular No. 121.

"International Trade in Pork and Pork Products," by Kmute Bjorka - Iowa Experiment Station Research Bulletin No. 122.

"Swine Sanitation," by L. Van Es - Nebraska Experiment Station Circular No. 39.

"Swine Publications and Associations," by Anderson and Evvard - Iowa Experiment Station Circular No. 122.

"Steer-Feeding Experiments in the Black Belt of Alabama," by J. C. Grimes - Alabama Experiment Station Bulletin No. 231.

"The Digestibility of Cottonseed Meal as a Supplemental Feed for Range Cattle in New Mexico," by W. E. Watkins - New Mexico Experiment Station Technical Bulletin No. 178.

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"Planning the Ranch for Greater Profit," by Gabbard, Bonnen and Tate - Texas Experiment Station Bulletin No. 413.

"Pastures for Spring and Fall Grazing," by Herbert C. Hansen - Colorado Experiment Station Bulletin No. 360.

"Stock Share Renting in Virginia," by Roy A. Ballinger - Virginia Experiment Station Bulletin No. 271.

"Bang's Disease and Abortion in other Farm Livestock," by A. F. Schalk - North Dakota Experiment Station Circular No. 40.

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